IN THE CLAIMS:

Please **CANCEL** claim 34 without prejudice or disclaimer.

Please **AMEND** claims 21, 23-28, 30-32, 36-38, and 40-42 as shown below.

Please **ADD** claims 43-47 as shown below.

1-20. (Cancelled)

21.   (Currently Amended) A~~n apparatus~~receiving station, comprising:

a signal filter ~~in communication with~~configured to filter a signal from a signal ~~receiving antenna~~receiver;

a signal estimator ~~in communication with~~configured to estimate channel operations of the signal from the signal filter;

a signal optimizer ~~in communication with~~configured to generate optimized values for the signal from the signal filter; and

a decision feedback sequence estimator configured to receive the generated optimized values ~~in communication with the signal optimizer~~, wherein the decision feedback sequence estimator comprises~~:~~ a prefilter, a summing element ~~in communication with the prefilter~~, a feedback filter ~~in communication with the signal optimizer and the summing element~~, and a maximum likelihood sequence estimator ~~in communication with the summing element~~,

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wherein <u>an</u> interconnection of the prefilter, the feedback filter, the maximum likelihood sequence estimator, and the summing element <u>is configured</u> ~~cooperatively operate~~ to permit concurrent interference and prefilter operations to be performed.

22. (Cancelled)

23. (Currently Amended) The <u>apparatus</u> ~~receiving station~~ of claim 21, wherein ~~an output of~~ the maximum likelihood sequence estimator is ~~in communication with~~<u>configured to transmit generated maximum-likelihood values through an output to</u> the feedback filter, and wherein an input of the maximum likelihood sequence estimator is ~~in communication with an~~<u>configured to receive summed values from</u> ~~output of~~ the summing element.

24. (Currently Amended) The <u>apparatus</u> ~~receiving station~~ of claim 23, wherein the feedback filter comprises a first input ~~in communication with~~<u>configured to receive the optimized values from</u> the signal optimizer and a second input ~~in communication~~<u>configured to receive the generated maximum-likelihood values from</u> ~~with an output of~~ the maximum likelihood sequence estimator.

25. (Currently Amended) The <u>apparatus</u> ~~receiving station~~ of claim 24, wherein the summing element <u>is further configured to receive</u> ~~receives~~ inputs from the prefilter

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and the feedback filter and <u>is further configured to send</u> ~~sends~~ a summed output to the maximum likelihood sequence estimator.

26.   (Currently Amended)   The <u>apparatus</u> ~~receiving station~~ of claim 21, wherein the signal filter comprises a feed forward filter.

27.   (Currently Amended)   The <u>apparatus</u> ~~receiving station~~ of claim 25, further comprising:

    a de-interleaver ~~in communication with~~<u>configured to de-interleave the signal from</u> an output of the maximum likelihood sequence estimator;

    a de-punctuator ~~in communication with~~<u>configured to de-puncture the signal from</u> the de-interleaver; and

    a channel decoder ~~in communication with~~<u>configured to decode the signal from</u> the de-interleaver.

28.   (Currently Amended)   The <u>apparatus</u> ~~receiving station~~ of claim 25, wherein the feedback filter <u>is further configured to receive</u> ~~receives~~ optimized signals from the signal optimizer that are used to define filter characteristics of the feedback filter.

29.   (Canceled)

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30.   (Currently Amended) The apparatus ~~receiving station~~ of claim 21, wherein the signal filter and the signal estimator comprise a receive chain.

31.   (Currently Amended) The apparatus ~~receiving station~~ of claim 30, wherein the ~~receiving station~~apparatus comprises a plurality of receive chains ~~that corresponds~~ corresponding to a plurality of signal ~~receiving antennas~~receivers configured to receive and transmit a plurality of signal data vectors to the plurality of receive chains.

32.   (Currently Amended) A method, comprising:

receiving a data vector;

forming optimized feed forward filter parameters from the data vector;

forming optimized feedback filter parameters from the data vector;

transmitting the optimized feed forward filter parameters and the optimized feedback filter parameters to a decision feedback sequence estimator, wherein the decision feedback sequence estimator comprises a feed forward filter and a feedback filter;

applying the optimized feed forward filter parameters to ~~a~~ the feed forward filter to define filter characteristics of the feed forward filter;

applying the optimized feedback filter parameters to ~~a~~ the feedback filter to define filter characteristics of the feedback filter; and

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simultaneously performing interference cancellation and pre-filtering operations on the data vector through operation of the feed forward and feedback filters,

wherein receiving a-the data vector comprises receiving a plurality of data vectors on a corresponding plurality of receiving chains.

33.   (Previously Presented) The method of claim 32, wherein simultaneously performing interference cancellation and pre-filtering operations comprises:

filtering the data vector with the feed forward filter and transmitting a feed forward filter output to a summing element;

receiving an output of the summing element in a maximum likelihood sequence estimator and generating an output that is transmitted to an input of the feedback filter and to a subsequent component; and

filtering the output received from the maximum likelihood sequence estimator in the feedback filter and transmitting a filtered signal to the summing element.

34-35. (Cancelled)

36.   (Currently Amended) The method of claim 32, wherein the receiving is conducted by a receiving filter in communication with a signal receiverreceiving antenna; and wherein the forming is conducted by a channel estimator in communication with the receiving filter, the channel estimator being in communication with an optimizer

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configured to generate the optimized feed forward filter parameters and the optimized feedback filter parameters.

37.   (Currently Amended) The method of claim 33, wherein the subsequent component comprises a de-interleaver, ~~connected to~~ a de-punctuator, and ~~the de-punctuator being connected to~~ a channel decoder.

38.   (Currently Amended) An apparatus ~~receiving station~~, comprising:

signal filter means ~~in communication with~~for filtering a signal from a signal ~~receiving antenna~~receiver;

signal estimator means ~~in communication with~~for estimating channel operations of the signal from the signal filter means;

signal optimizer means ~~in communication with~~for generating optimized values for the signal from the signal filter means; and

interference cancellation means for receiving the generated optimized values to perform concurrent interference and prefilter operations. ~~in communication with the signal optimizer means,~~

wherein the interference cancellation means comprises

~~a~~prefilter means;

~~a~~summing means for summing ~~in communication with~~inputs from the prefilter means;

a feedback filter means for filtering ~~in communication with~~optimized values and a summed output from the signal optimizer means and the summing means, respectively; and

a maximum likelihood sequence estimating means ~~in communication with~~for generating maximum-likelihood values from the summing means,

wherein an interconnection of the prefilter means, the feedback filter means, the maximum likelihood sequence estimating means, and the summing means is configured ~~cooperatively operate~~ to permit the concurrent interference and prefilter operations to be performed.

39.   (Canceled)

40.   (Currently Amended)   The apparatus ~~receiving station~~ of claim 38, wherein ~~an output of~~ the maximum likelihood sequence ~~estimator~~ estimating means is further for transmitting the generated maximum-likelihood values through an output to ~~in communication with~~ the feedback filter means, and wherein an input of the maximum likelihood sequence estimating means is ~~in communication with~~further for receiving summed values from ~~an output of~~ the summing means.

41.   (Currently Amended)   The apparatus ~~receiving station~~ of claim 40, wherein the feedback filter means comprises a first input ~~in communication with~~configured to

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receive the optimized values from the signal optimizer means and a second input in communication with an output configured to receive the generated maximum-likelihood values from of the maximum likelihood sequence estimating means.

42. (Currently Amended) The apparatus receiving station of claim 41, wherein the summing means is further for receiving receives inputs from the prefilter means and the feedback filter means and is further for sending sends a summed output to the maximum likelihood sequence estimating means, an output of the maximum likelihood sequence estimating means being an output from the receiving station apparatus.

43. (New) A computer readable storage medium encoded with instructions that, when executed by a computer, perform a process, the process comprising:

receiving a data vector;

forming optimized feed forward filter parameters from the data vector;

forming optimized feedback filter parameters from the data vector;

transmitting the optimized feed forward filter parameters and the optimized feedback filter parameters to a decision feedback sequence estimator, wherein the decision feedback sequence estimator comprises a feed forward filter and a feedback filter;

applying the optimized feed forward filter parameters to the feed forward filter to define filter characteristics of the feed forward filter;

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applying the optimized feedback filter parameters to the feedback filter to define filter characteristics of the feedback filter; and

simultaneously performing interference cancellation and pre-filtering operations on the data vector through operation of the feed forward and feedback filters,

wherein receiving a data vector comprises receiving a plurality of data vectors on a corresponding plurality of receiving chains.

44. (New) The computer readable storage medium according to claim 43, wherein simultaneously performing interference cancellation and pre-filtering operations comprises:

filtering the data vector with the feed forward filter and transmitting a feed forward filter output to a summing element;

receiving an output of the summing element in a maximum likelihood sequence estimator and generating an output that is transmitted to an input of the feedback filter and to a subsequent component; and

filtering the output received from the maximum likelihood sequence estimator in the feedback filter and transmitting a filtered signal to the summing element.

45. (New) The computer readable storage medium according to claim 44, wherein the subsequent component comprises a de-interleaver connected to a de-punctuator, the de-punctuator being connected to a channel decoder.

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46.   (New) The apparatus of claim 21, wherein the apparatus is a mobile communications device.

47.   (New) The apparatus of claim 21, wherein the apparatus is an integrated circuit.

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